**Template | Unit Enhancement**

***EXPLANATION & ARGUMENTATION***

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Background Information**

**Instructional Materials Title: Sound**

**Publication Date:**

**Work Group Participants: Lisa Boveng, Deb Spitzer, Heather Christothoulou, Julie Keller, Jessica Thomashow, Paula Eisenrich, Rebecca Lee**

**Date Developed: 8.23.2013**

**High Leverage Lesson (Title and Page Number): EXPLORING PITCH # 5 Manual: pages 43-47 Instructional guide: pages 21-22**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Rationale**

· **Why we identified this particular lesson: This lesson provides an authentic opportunity for students to practice claim and evidence in order for them to demonstrate their understanding of the relationship between length and pitch.**

**- Connections to NGSS Practices and WA Science Standards:**

WA: 4-5PS3D

NGSS: 3-PS2-2

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Explanation* Lesson Enhancement**

**Overview**

· **Identification of where within the High Leverage Lesson to insert enhancement: Lessons 2, 3, & 4 students will have opportunities to observe the relationship between length and pitch. Therefore, in lesson 5 students will be able to support a claim with evidence.**

· **Key instructional strategies and tools needed: Tuning forks, rulers, meter sticks, nails, xylophone, etc.**

**Part 1: Lesson Modifications to Lead Up to *Explanation* Experience**

**No modifications necessary, follow the manual and Instructional Guide.**

**Part 2: *Explanation* Learning Sequence**

This lesson is a culmination of a series of lessons in which students build an understanding of the relationship between length and pitch. Follow the lesson according to the Instructional Guide until the Reflect and Explain section. The CER is inserted between the Reflect and Explain and the Apply and Extend.

Add to the Reflect and Explain discussion:

Students practice stating a one-sentence claim with partners. Students practice using quantitative data as part of their evidence, when possible (rulers).

**Part 3-A: Describe Assessment Task**

*Include the* ***question****,* ***evidence*** *students will use, and* ***scientific concepts*** *students will use in their reasoning.*

Question: What is the affect of length on pitch?

Data: Different lengths of tuning forks, nails, rulers, meter sticks and xylophone bars and the different pitches produced. Students should use qualitative (long and short) and quantitative (measurement of ruler length) data to describe length.

Possible claims:

Big things make a low sound little things make a loud sound. (incorrect/naïve claim)

Length affects pitch. (average claim)

The affect of length on pitch is that long objects produce low pitches and short objects produce high pitches. (strong claim)

Possible/acceptable evidence:

Students refer back to tuning forks, nails, xylophone, rulers, meter sticks, and use evidence from at least 3 of the investigations.

For example: “The tuning fork produced a low pitch, but the short tuning fork produced a high pitch.”

Reasoning:

Students will not have enough experience or evidence to identify reasoning until after lesson 11.

**Part 3-B: Assessment Rubric**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Additional Information**

NOTES

· Information that will be useful when teaching this lesson

- Resources that will be useful

- Scaffolds that students will use